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ABSTRACT

Sex differences in language development were studied. Protocols from 54 children, aged 2;0 to 4;2, were analyzed with Mean Length of Utterance (MLU) as the independent variable. When MLU's reached 3.75 to 4.0, differences began to favor girls. Results are discussed in terms of a social learning model and a cognitive model. (Author)

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Sex Differences in Early Language Development

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Sex Differences in Early Language Development

In their review of the sex differences literature, Maccoby and Jacklin (1974) report that female superiority on verbal tasks has been one of the most solidly established generalizations in the field. They suggest, however, that this difference is not as strong as previously believed. There is very little recent work with large samples of younger children; but what there is suggests to Maccoby and Jacklin that differences in verbal ability between the ages of 3 and 11 are non-existent. Prior to age 3, there has been almost no normative work since the 1930's and 1940's.

Recent work on language development has involved very small and select samples of children. While not yielding information on sex differences, a great deal has been learned about the acquisition of language. One of the clearest findings is that age alone is not a good predictor of linguistic ability in the very young child. For example, in the present study, children 2;6 had a range of Mean Length of Utterance (MLU) of from 2.1 to 6.2. It is generally agreed (Brown, 1973) that MLU is a better predictor of linguistic maturity than is age. Since (1) there are such wide individual differences for both boys and girls and (2) language develops within a relatively short time span--two or three years from the onset of one-word speech--there may be differences that have not been detected using age as the independent variable. The present study, therefore, groups children according to MLU for analyses.

Method

Subjects

Speech was elicited using a picture elicitation task from fifty-four children between 24 months and 50 months old; there were three boys and three

girls in each three-month interval. Subjects under four years of age were tested a second time, three months after the first session.

The Mean Length of Utterances's was determined for children based on Brown (1973). For randomly selected subjects, MLU's were computed for the spontaneous speech produced before and after the experiment. Analyses showed no differences between spontaneous and elicited language (Horgan, 1975). The present study uses only elicited language.

Materials

Line drawings, on five by eight index cards, were mounted in a loose leaf binder. The book was divided into three parts. Part I consisted of pictures similar to the experimental set with single-sentence descriptions written underneath. This was a "warm-up" section, and also served to model the child's task.

Part II was the experimental section. Forty-four pictures represented a wide range of semantic relations. Part III was a vocabulary check. All the objects in Part II were presented individually for the child to identify. Throughout the book, at random (and frequent) intervals, "Prize" pages occurred. Prizes consisted of stickers or seals which the child attached to construction paper.

All stimuli were pre-tested with ten children aged two to four years to determine whether objects and actions seemed familiar to the children. All items with unusually low response rates were omitted.

Procedure

Subjects were tested in their homes with a parent present. The sessions were tape recorded, and a sample of spontaneous speech was recorded before and after the actual experiment. The experimenter, sometimes an observer, and usually a parent were present.

In the first section, the experimenter read to the child and the pictures were discussed. At this point, if the child did not volunteer comments about the pictures, s/he was asked direct questions with regard to "The boy's taking a bath," etc. By the end of the first section, children were talking freely. In the second section--the experimental section--the child was asked to tell about the pictures. If s/he only named objects, s/he was asked "What about the X and Y?" or "What's happening with that X and that Y?"

In the third section--the vocabulary check--the child was presented with pictures of objects from the experimental section and asked "What's that?"

Subjects under 4;0 were retested after three months, using exactly the same procedure.

Grammatical constructions

For children with MLU's past 4.0, the types of constructions used were considered to evaluate sex differences.

The following constructions were examined:

(1) Full passives. Examples from the data include, The snowman's melted by the sun, The lamp was broken by the ball.

(2) Truncated passives. Examples from the data include The window's broken, Car got crashed, The house is broken, Tree got blowed.

(3) Reflexives. Examples from the data include The bell it's tinkling by itself, The lamp gets broke by itself, It broke by itself.

(4) Conjunction with deletion. Since children often string unrelated sentences together with "and," only conjunctions were counted when there had been a deletion. Examples include It couldn't get out and went in there, The ball hit the window and crashed, The cat and dog are running.

(5) Relative clauses. Examples include (the relative clause is in

parentheses) She broke the bulb (which was cracked), The same thing (we were a minute ago), Thata sun melt the same thing again (that made those sticks), That a tree (that a man chopped down), Did you see the painting (I did do)?

(6) Nominals. A nominal is a clause functioning as a noun. Examples of complex nominals found include (the nominal is in parentheses) The dog is trying (to eat the girl), He forgot (to shut the door), It's a hole, 'cause that's (what they make out of trees--holes), The girl see (the plant fall out of the pot).

(7) Non-specific subjects. Examples from the data are Someone broke the lamp, Somebody left the door open.

(8) Non-specific objects. Examples from the data include He's gonna do something, She broke something.

(9) Participles. A participle is a word derived from a verb used as an adjective. Examples from the data include The car got stuck wheel, The moving truck crashed the car, The tinkling bell.

(10) Complex sentences with some type of subordinate clause. Examples from the data include When the snow comes back, he will be glad, When I was dead a policeman was gonna come and get me, I have a ball and if I throw it in the house that will make my Mom angry, That girl has a bell, too, just like Kimmy too.

(11) Adverbial complements. All subjects produced locatives of this sort. Examples include (the complement is in parentheses) The cat is (on the table), Tree came out (of the hole), He's (under table), He's doing (on the back).

(12) "With" used with an instrument. Examples include The man broke the window with the bat ball, She hit her back with the ball.

Errors. Another way to examine sex differences is to compare the errors produced by girls to those produced by boys. Four types of errors were considered:

(1) Pronoun gender errors. Most of these involved using the male form when the female was required. (Two girls, however, used female forms when referring to males.) From the comprehension task and the identification task, it was clear that children could differentiate the sex of people in the pictures.

(2) Pronoun case errors. All involved use of the objective case when the nominative case was required, e.g., Him's a mother, Her has a bell, Him didn't look both ways.

(3) Errors of tense. Examples include The house is gonna broke, She gots a ball, A train is crashed a big truck, Plant is fall down.

(4) Errors in number agreement. Examples include There's no peoples in there, Our cats runs, There's two buses, A dog don't.

Results

For the first series of analyses, each protocol was treated as if from a separate subject. This yielded 90 protocols (six children over 4;0 were not retested, 12 subjects were lost for various reasons such as their families' moving or equipment failure).

The overall mean MLU for boys was 4.60 and for girls, 4.57. The distribution of MLU's differed for the sexes, however. ($p < .01$ Wald-Wolfowitz runs test). Girls were over-represented at the earliest stages (MLU < 3.13) and at later stages(MLU between 4.75 and 5.75). Past MLU 5.75, the sexes were evenly distributed. During the earliest stages, boys were also slightly younger, suggesting further that boys may be more advanced at the earliest stages of language development.[1] Girls with MLU's past 4.75 were somwhat younger

than boys with MLU's past 4.75 ($p < .1$, t test), providing further evidence that girls are more advanced than boys later in the acquisition process.

Figure 1 shows the magnitude of the differences between the sexes at

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Insert Figure 1 About Here

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increasing MLU irrespective of age. Sometime around MLU 3.75 to 4.0, a shift seems to occur. For further analyses, protocols were therefore divided into two groups: pre- and post-MLU 4.0. Tables 1 and 2 give the statistics for

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Insert Tables 1 and 2 About Here

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these two groups. The point 4.0 was somewhat arbitrarily chosen so that the number of boys and girls in each group would be the same. The mean ages for boys and girls in each group were identical, so that further analyses could be done holding age constant.

One way to assess development is to examine the amount of progress made during a certain interval. Table 3 shows the increases in MLU for boys versus girls during the three-month interval between sessions. Table 3 shows that boys and girls tested prior to MLU 4.0 progressed equally. But, for children tested initially after MLU had reached 4.0, half of the boys showed no progress at all.

Table 4 shows the percentage of boys versus girls (with MLU past 4.0)

Insert Tables 3 and 4 About Here

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who used the various grammatical constructions. Although not significant, there was a trend for girls to use more varied constructions.

The analyses on errors considered only children with MLU over 4.0. Children prior to this point rarely used pronouns or rarely produced utterances

where gender, tense, or number agreement was obligatory. More errors were made by boys than by girls: 76% of gender errors, 100% of case errors, 69% of tense errors, and 65% of number errors were made by boys ($p < .01$, chi-squared).

Girl's pronoun errors are of particular interest. No girl made a single case error, yet almost one third made gender errors. Further, two girls over-generalized the marked gender form--the female, using "she" when "he" would be appropriate. (Over-generalizations usually involve unmarked forms.) One could speculate that some girls are confused by the use of male form as the unmarked form in neutral situations. The assymmetrical nature of the pronoun system with regard to gender may cause some girls difficulty.

Discussion

Boys may be slightly ahead at the earliest stages. Sometime around MLU 3.75 to 4.0, girls surpass boys. Girls produce longer utterances at younger ages, more varied construction, and make fewer errors.

The point at which girls surpass boys has several important implications. First, it is definable only in terms of linguistic maturity, not age. Children with MLU's about 3.75 to 4.0 ranged in age from 2;0 to 4;2. The two year age range is particularly significant since the average child learns most of his grammer in about two years after he starts speaking. This suggests that social rather than maturational factors are responsible. It is difficult to imagine any sort of biological process that would occur independently of age, but would differentially begin to favor girls only when linguistic maturity passed a certain point. Neural development as a result of having learned more language, for example, should benefit the sexes equally. Although biological facts (such as degree of lateralization) may compound the effect, the social atmosphere seems to have

a significant effect at a point defineable by linguistic maturity, and not age.

Second, MLU's of 3.75 to 4.0 seem to represent a linguistic and social turning point--at this point children are just beginning to produce adult-like sentences. This linguistic turning point is surely correlated with differences in the way the child is perceived and treated by adults and older children. 'Someone who can talk' is treated much differently than someone who has very limited communicative skills. We would predict that prior to this point, the child is treated as a "baby", and after this point, as a boy or girl.

The data are compatible with either a social learning theory or a cognitive theory of sex role development. On the social learning view, the analysis suggests that either differential reinforcement does not occur until children are forming 'real' sentences--around MLU 4.0--or that differential reinforcement does not have an effect until the child is linguistically advanced enough to form 'real' sentences of about 4 morphemes. On the cognitive view, it's reasonable to expect that children with MLU's past 4.0 are more advanced cognitively than are those with lower MLU's. The more cognitively advanced child would thus have a clearer image of his or her sex role. Thus, we would expect to see behavior falling into the expected male/female patterns depending on cognitive level i.e., MLU-rather than on age level. On either view, at a point defined in terms of linguistic maturity, children get the message that girls are expected to be more verbal than boys.

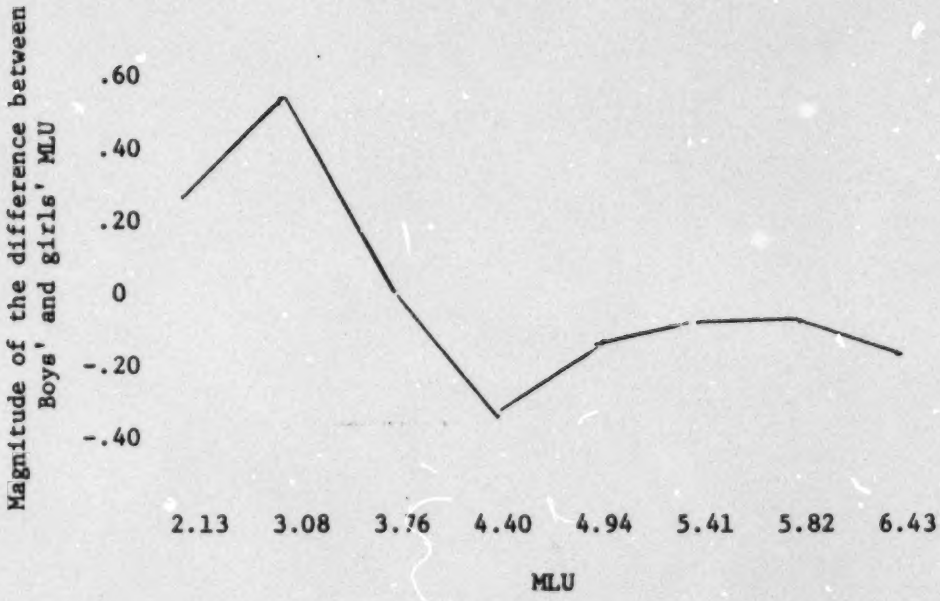

Figure 1. Differences in MLU: Boys' MLU - Girls' MLU. Each point represents 10 Ss, 5 boys and 5 girls. The MLU's on the abscissa represent the mid-points of the 10 Ss' MLU, rank-ordered by sex.

Table 1

Subjects with MLU under 4.0

	Boys	Girls
Number of Subjects	15	15
Mean Age	2;8	2;8
Mean MLU	3.03	2.92[a]

[a]Not significant, p between .1 and .2, Mann-Whitney Test

Table 2

Subjects with MLU over 4.0

	Boys	Girls
Number of Subjects	30	30
Mean Age	3;6	3;6
Mean MLU	5.37	5.52[a]

[a]Not significant, p between .1 and .2, Mann-Whitney test.

Table 3

Increase in MLU at Second Session

	MLU at First Session			
	< 4.0		> 4.0	
Amount of Increase	Number of Boys	Number of Girls	Number of Boys	Number of Girls
High (> .5)	8	9	4	6
Low	0	0	2	0
None	0	0	6	1[a]

[a] $p < .1$, chi squared

Table 4

Percentage of Subjects Using Various Constructions

Construction	Boys	Girls
Full passive	6.45	19.20
Truncated passive	48.40	65.40
Reflexive	16.10	19.30
Conjunction	48.40	54.00
Relative clause	19.40	19.20
Nominalization	67.70	57.70
Non-specific subject	40.00	23.20
Non-specific object	9.70	19.35
Participle	6.45	19.30
Subordinate clause	29.00	38.50
"With" used as instrument	38.70	34.60

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Footnotes

This study is based on part of a dissertation submitted in partial fulfillment of the requirement for the PhD degree at the University of Michigan, Ann Arbor, Michigan. Part of the data was presented at the 1976 meeting of the Midwestern Psychological Association. The author wishes to thank Dr. Klaus Riegel for his guidance and suggestions. Author's address: Department of Psychology, Northern Illinois University, DeKalb, IL 60115.

[1]This finding may be an artifact resulting from a confounding of effects of sex differences and birth order. By chance, later-born girls were somewhat over-represented among the younger subjects. Overall, it was found that later-borns were slower than first borns.